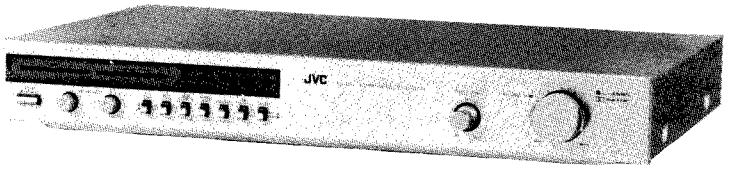
JVC

SERVICE MANUAL

MODEL

NR-50 A/B/C/E/J/U

NOISE REDUCTION UNIT



No. 4201
June 1981

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Features

1. Built-in DOLBY C NR system
2. Built-in Super ANRS, ANRS/DOLBY B NR systems
3. MPX filter
4. Calibration system
   for recording – 400 Hz OSC circuit
   for playback – Calibration volume and indicator (5 LED x 2)
5. Output level control

Specification

NR system : DOLBY C NR, Super ANRS and DOLBY B NR
Channel : 2 channels
Frequency response : 20 Hz – 20,000 Hz ± 1 dB
Distortion : 0.12% (400 Hz, DOLBY C NR level, Harmonic distortion)
Effect of NR : (Cassette deck use)
Improvement of S/N;
The S/N is improved by approx. 15 dB at 500 Hz, and approx. 20 dB above 1 kHz – 10 kHz with DOLBY C NR on, and by 10 dB above 5 kHz with ANRS/DOLBY B on.
Improvement of MOL;
The MOL is improved by 4 dB at 10 kHz
Effect of Super ANRS: (normal tape)
Improvement of S/N;
The same as with ANRS/DOLBY B NR
Improvement of frequency response;
0 dB recording; 6 dB at 10 kHz
+5 dB recording; 12 dB at 10 kHz
Improvement of distortion;
0 dB recording; 3% or less at 10 kHz
+5 dB recording; 3% or less at 10 kHz
Input terminals : LINE (x 2); 80 mV
(Input impedance; 70 kΩ)
TAPE PLAY (x 2); 150 mV
(Input impedance; 60 kΩ)
Output terminals : LINE (x 2); 0–0.5 V
(Output impedance; 2.3 kΩ)
TAPE REC (x 2); 0.5 V
(Output impedance; 1.5 kΩ)
Power requirement : AC 240/220/120 V, 50/60 Hz
Power consumption : 30 W
Dimensions : 420(W) x 60(H) x 252(D) mm
16-5/8"(W) x 2-5/8"(H) x 10"(D)
Weight : approx. 3.0 kg (6.6 lbs)
Accessory : Pin cord x 2

Design and specifications are subject to change without notice.

DOLBY is trademark of Dolby Laboratories.

Controls and Connections

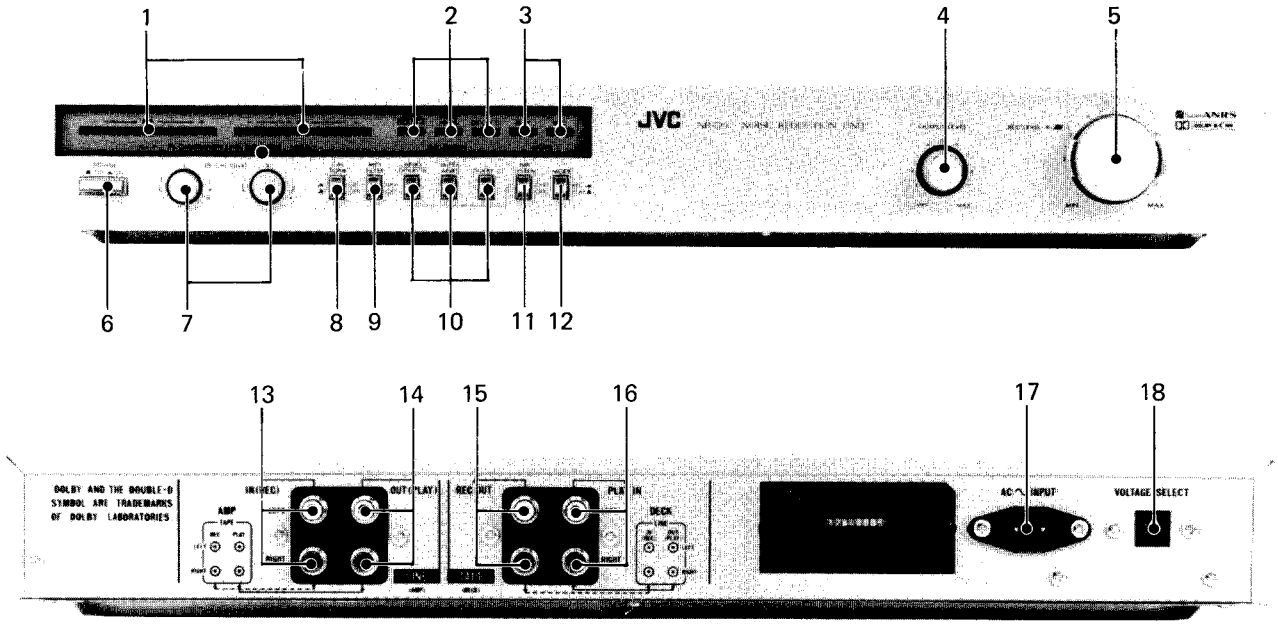


Fig. 1

1. PB CALIBRATION LEVEL INDICATOR
2. NR SYSTEM indicator
   ($\frac{\text{ANRS}}{\text{DOLBY B}}$ – SUPER ANRS – DOLBY C)
3. MODE indicator (PLAY – REC)
4. OUTPUT LEVEL control
5. REC (recording) LEVEL control
6. POWER switch
7. PB CAL (calibration) LEVEL control
8. CAL TONE switch
9. MPX FILTER switch
10. NR SYSTEM selector
    ($\frac{\text{ANRS}}{\text{DOLBY B}}$ – SUPER ANRS – DOLBY C)
11. NR ON/OFF switch
12. MODE switch (REC – PLAY)
13. Input terminals for amplifier
14. Output terminals for amplifier
15. Output terminals for deck
16. Input terminals for deck
17. Inlet
18. Voltage selector

Main Parts Location

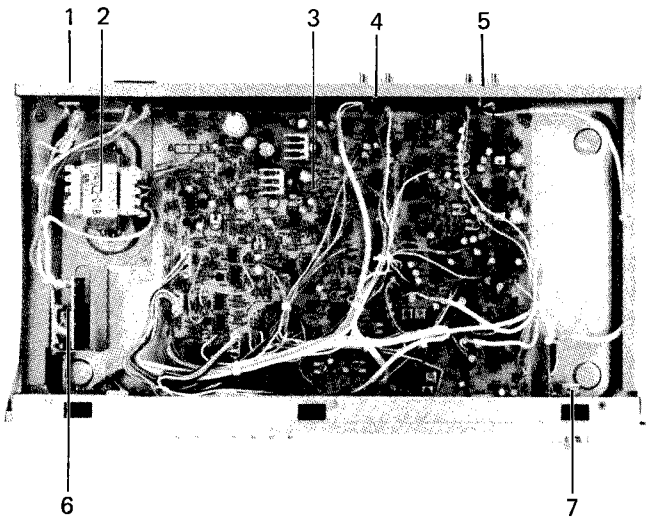


Fig. 2

1. Inlet
2. Power transformer
3. Main P.W. Board assembly
4. Terminals for deck
5. Terminals for amplifier
6. Power switch
7. Recording level control

Description on New Technology

Dolby* C-Type Noise Reduction System: Noise is reduced and MOL increased dramatically.

The Dolby C-type closely resembles the B-type in operation, the system compatible with ANRS, yet offers even better performance and more distinctive features. Namely:

- It provides about 20 dB above 1 kHz, and 15 dB even at 500 Hz of noise reduction.
- At 10 kHz (at 0 VU recording), it improves MOL by 4 dB maximum.
- It is immune to undesirable side effects, such as modulation noise and breathing.
- Finally, it is tolerant of noise reduction encode/decode errors. Level matching is not critical.

(*Dolby is a trademark of Dolby Laboratories, Inc.)

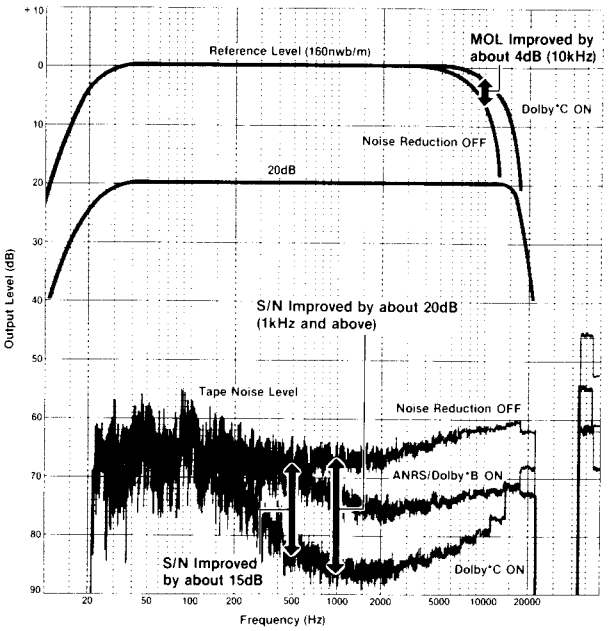


Fig. 3 Dolby* C Improvement

The basis of C-type noise reduction

Dolby C noise reduction solves the problem of achieving a large amount of compression and expansion without introducing undesirable side effects by the use of two processing stages in series, each supplying 10 dB of compression during recording and of expansion during playback. These circuits operate at independent levels. One, identified as the high-level stage in Figure 5, is sensitive to signals at about the same levels as Dolby B-type noise reduction, while the other, the low-level stage, operates on signals of somewhat lower level. Because the two stages operate in tandem with each other, their effect is to multiply the signals (or add and subtract in dB's), so that a total of 20 dB of compression and expansion, and thus of noise reduction, is accomplished. Yet simultaneously, at no time is the signal subject to the vagaries of a single compression or expansion action of 20 dB. In other words, the tandem two-level, two-stage configuration provides a much more accurate control of the signal than a single compander circuit would be able to achieve.

Two conventional Dolby B IC circuits are used in a modified way in C-type noise reduction to carry out the two-level, two-stage scheme. Thus a desirable side benefit of C-type noise reduction is that it can be executed from the beginning with readily available and economical parts (the development of a dedicated Dolby C integrated circuit in the future would, however, simplify incorporating C-type NR in products). Furthermore, one of the two stages can be easily configured to provide the B-type characteristic at the push of a switch, so cassette decks incorporating C-type noise reduction can be economically equipped with Dolby B NR as well for perfect compatibility with existing B-type recordings.

Other developments

In addition to two-level processing, Dolby C-type noise reduction incorporates a number of further innovations. Two of these, shown in Figure 5 as anti-saturation and spectral skewing networks, are carefully calculated frequency response modifications introduced in the encoding (record) process and reciprocally compensated for in the decode (playback) process. Their purpose is two-fold: to further guard against audible side effects, and to ensure the practicality of the system in day-to-day consumer use. The specific benefits of these innovations include the reduction of encode-decode errors and a reduction of upper-middle and high frequency tape saturation and its side effects, such as high frequency losses and intermodulation distortion. Together with the two-level, two-stage configuration, these new developments result in a 20 dB noise reduction system at least as free of side effects as the 10 dB B-type system, and one which is just as practical in day-to-day use.

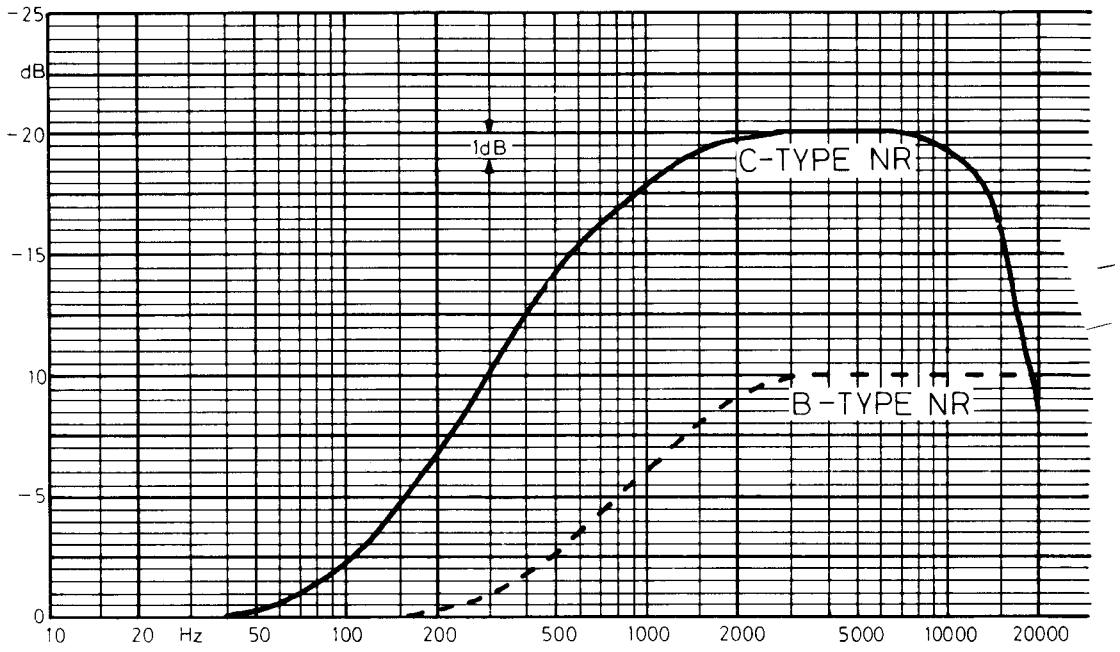
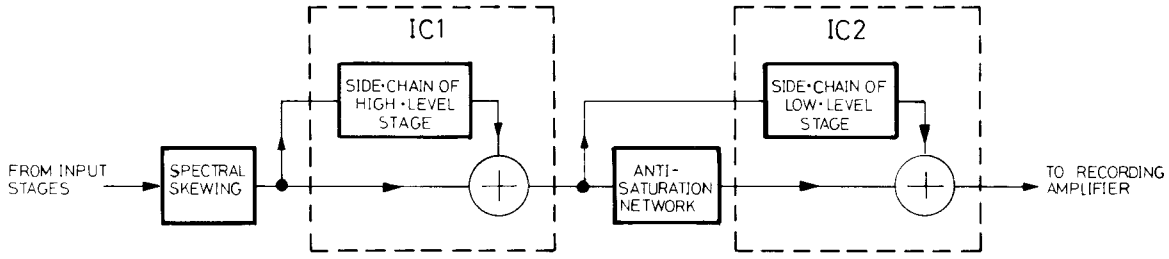


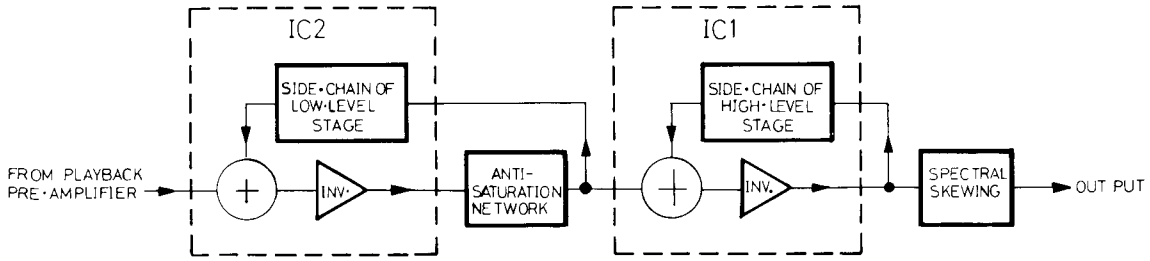
Fig. 4 Low-level encoding frequency response

These curves, showing the maximum low-level boost imparted by both C-type and B-type noise reduction in the absence of high frequency signals, illustrate some of the similarities and differences between the two systems. Dolby C noise reduction imparts more boost in recording and more cut in playback, thus providing more noise reduction.

The effect also extends about two octaves lower with C-type noise reduction to maintain subjectively uniform noise level across the spectrum. Processing at very low frequencies is not required with either system because low frequency noise is insignificant in properly engineered cassette recorders.



DOLBY C-TYPE ENCODER



DOLBY C-TYPE DECODER

Fig. 5 Dolby C-type NR block diagram

Removal of the main parts

1. **Top cover**
   Remove 4 screws (1) (each side, 2 pcs.).

2. **Bottom cover**
   Remove 7 screws (2).

3. **Front plate assembly**
   1) Pull off the knobs;
      2 calibration level knobs (3)
      An output level knob (4)
      Left and right input level knobs (5)
   2) Remove 4 screws (6);
      Upper side ..... 3 pcs.
      Bottom side ... 1 pc.

4. **Main P.W.B. assembly**
   1) Remove 2 screws (7) fastening the switch ass'y.
   2) Remove a washer and a nut (8) fastening the shaft of output level VR.
   3) Remove 3 screws (9) fastening the main P.W.B. on rear side.
   4) Pull off the main P.W.B. ass'y to rear side.

5. **Indicator P.W.B. ass'y**
   1) Remove a screw (10) fastening the indicator P.W.B. on the front plate inside.
   2) Remove 2 pawls on the front plate inside for indicator P.W.B.

6. **Power transformer**
   Remove 2 screws (11).

7. **Power switch**
   Remove 2 screws (12).

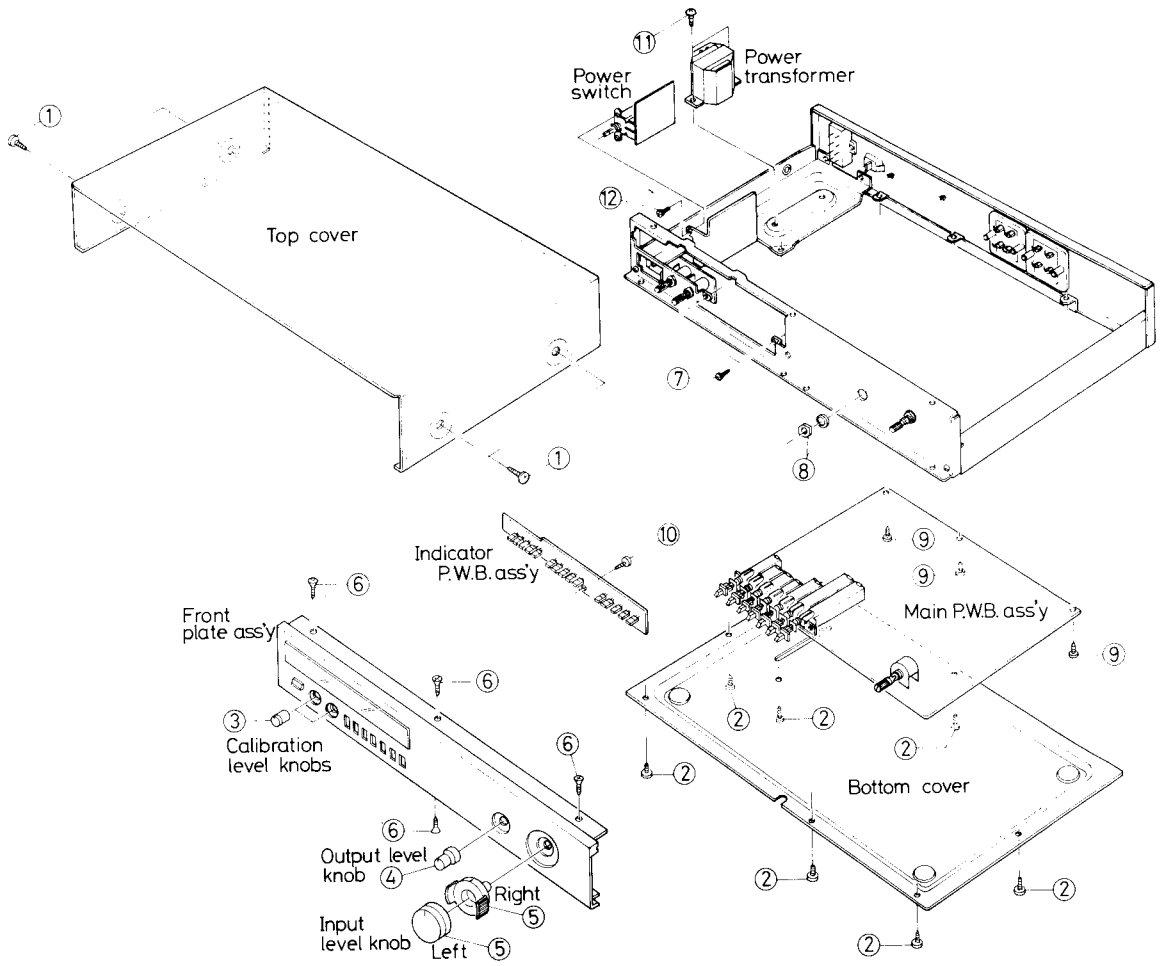
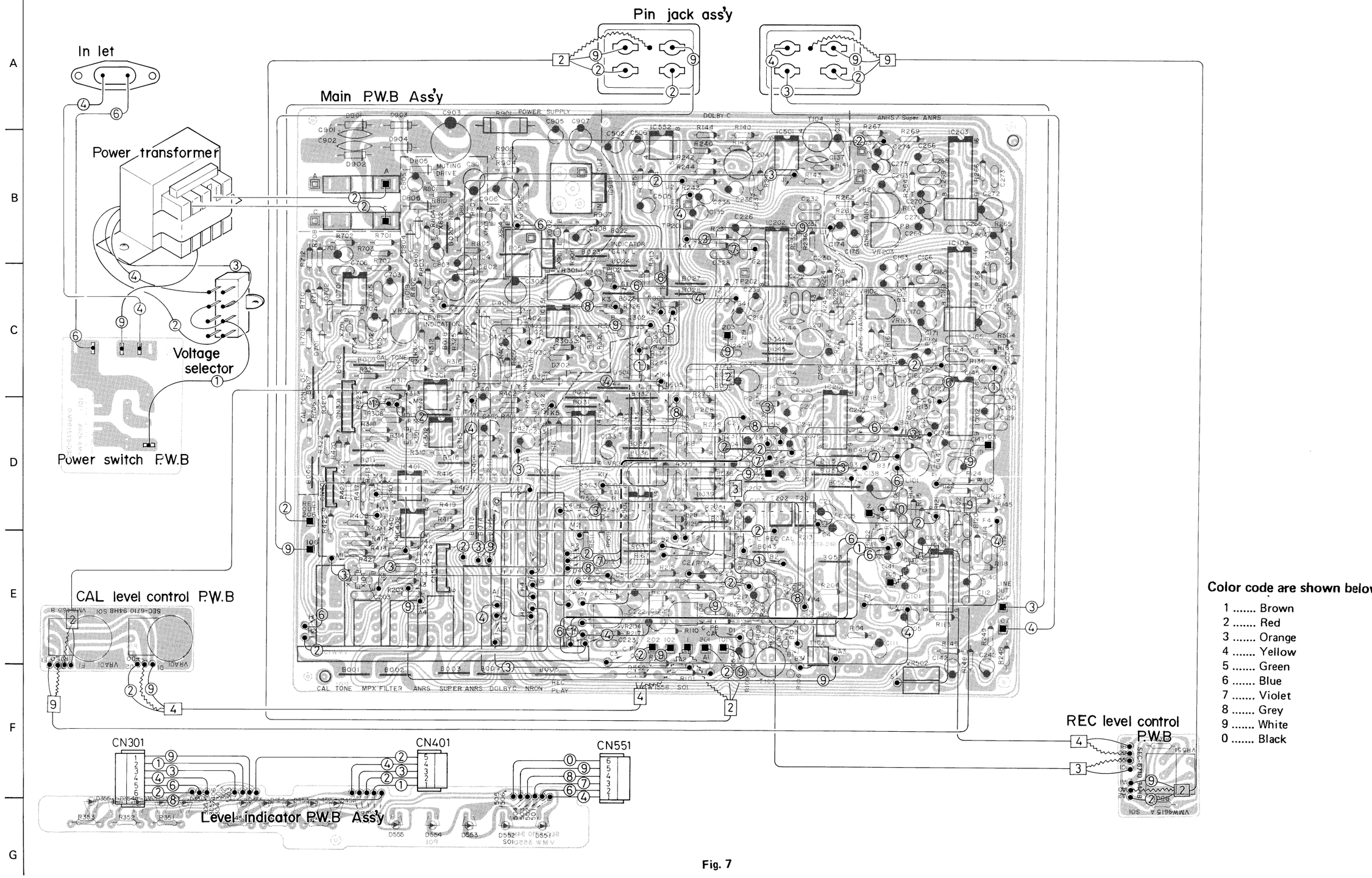


Fig. 6

Wiring Connector

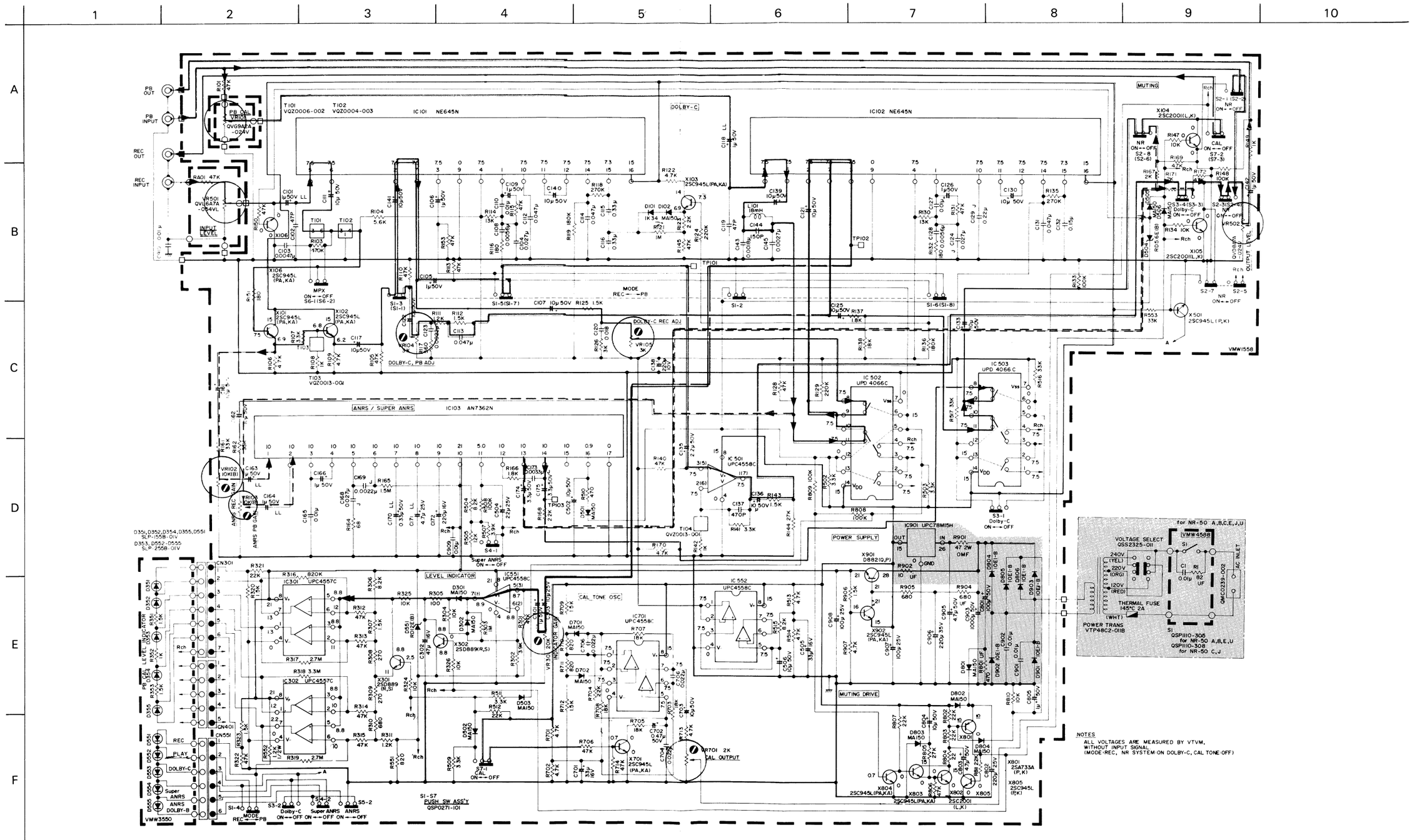


Color code are shown below

1 ..... Brown
2 ..... Red
3 ..... Orange
4 ..... Yellow
5 ..... Green
6 ..... Blue
7 ..... Violet
8 ..... Grey
9 ..... White
0 ..... Black

Fig. 7

Standard Schematic Diagram



NOTES
ALL VOLTAGES ARE MEASURED BY VTVM, WITHOUT INPUT SIGNAL (MODE:REC, NR SYSTEM:ON DOLBY-C, CAL TONE:OFF)

NOTES.

1. Unless otherwise specified, all resistors are 1/4W, ±5% Carbon resistors,
   And all capacitors are 50 V fixed ceramic capacitors or 50V mylar capacitors.
2. UF – Unflammable carbon resistor
   OMF – Oxided metal film resistor
   LL – Low leak current electrolytic capacitor (±20% tolerance)
   PP – Polypropylene capacitor
3. Blue line shows the signal at playback.
   Red line shows the signal at recording and +B circuits.
4. ▨ parts are safety assurance parts. When replacing those parts, make sure to use the specified one.

Fig. 8

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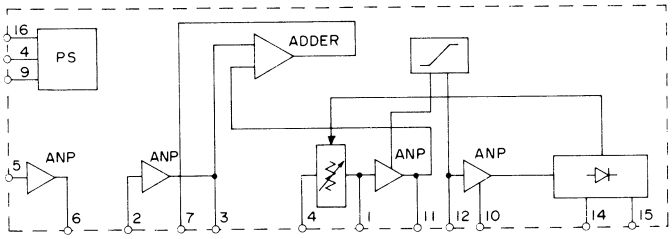
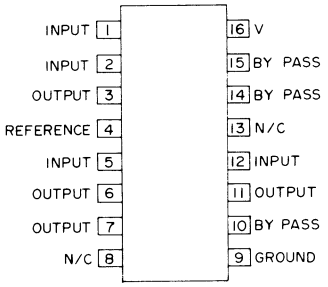
Integrant Circuits

IC101, 102, NE645N Dolby C NR circuit



N PACKAGE



IC103 AN7362N ANRS & Super ANRS

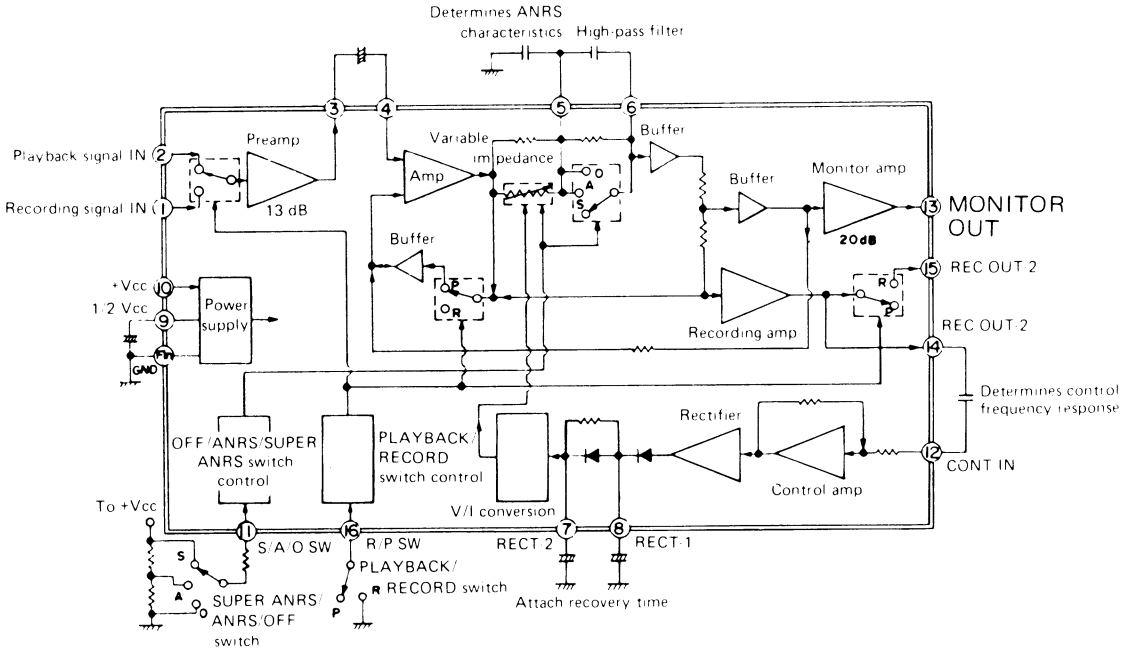


Fig. 9

Standard Voltage Value

Voltage values are measured by the following meter without input signal at recording mode.

		I	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC101,201 NE645N	E.Voltmeter	Cannot measure	7.5	7.5	7.5	7.5	7.5	7.5	NC(0)	0	7.5	7.5	7.5	NC(0)	7.5	7.3	15.0
	C.Tester		7.3	7.4	7.4	6.0	7.4	7.4	—	0	7.4	7.4	7.3	—	7.3	6.7	15.0
IC102,202 NE645N	E.Voltmeter		7.5	7.5	7.5	7.5	7.5	7.5	NC	0	7.5	7.5	7.5	NC	7.5	7.3	15.0
	C.Tester		7.3	7.4	7.4	6.0	7.3	7.4	—	0	7.4	7.4	7.3	—	7.3	6.8	15.0
IC103,203 AN7362N	E.Voltmeter	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	21.0	5.0	10.0	10.0	10.0	10.0	0.9
	C.Tester	6.4	6.4	10.0	6.4	10.0	10.0	9.8	10.0	10.0	21.0	4.3	10.0	11.0	11.0	11.0	0.9
IC501 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	6.0	0	6.0	7.4	7.4	15.0								
IC502 UPD4066C	E.Voltmeter	7.5	7.5	7.5	7.5	15.0	15.0	0	7.5	7.5	7.5	7.5	0	0	15.0		
	C.Tester	6.3	7.4	7.4	7.4	15.0	15.0	0	7.4	7.4	7.4	6.4	0	0	15.0		
IC503 UPD4066C	E.Voltmeter	7.5	7.5	7.5	7.5	0	0	0	7.5	7.5	7.5	7.5	15.0	15.0	15.0		
	C.Tester	6.8	6.8	6.8	7.2	0	0	0	7.2	6.8	6.8	6.8	15.0	15.0	15.0		
IC301,401 UPC4557C	E.Voltmeter	1.3	11.0	8.8	0	8.8	12.0	1.3	21.0								
	C.Tester	1.3	8.8	8.3	0	8.3	9.7	1.3	21.0								
IC302,402 UPC4557C	E.Voltmeter	1.2	10.0	8.8	0	8.8	10.0	2.2	21.0								
	C.Tester	1.2	8.6	8.3	0	8.3	8.1	2.3	21.0								
IC551 UPC4558C	E.Voltmeter	8.9	8.8	8.7	0	8.7	8.8	8.9	21.0								
	C.Tester	8.8	8.7	7.0	0	7.0	8.7	8.8	21.0								
IC552 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	7.0	0	7.0	7.4	7.4	15.0								
IC701 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	6.8	0	7.4	6.8	7.4	15.0								
IC901		IIN.	OUT	GND													
	E.Voltmeter	26.0	15.0	0													
	C.Tester	26.0	15.0	0													

		E. Voltmeter			C. Tester		
		E	C	B	E	C	B
X101	2SC945L(PA.KA)	6.9	15.0	7.5	6.8	15.0	7.2
X102	2SC945L(PA.KA)	6.2	15.0	6.8	6.2	15.0	6.6
X103	2SC945L(PA.KA)	6.9	14.0	7.3	6.8	15.0	3.6
X104	2SC2001(L.K)	0	0	0	0	0	0
X105	2SC2001(L.K)	0	0	0	0	0	0
X106	2SC945L(P.K)	0	0	0	0	0	0
X301	2SD889(R.S)	11.0	8.8	2.5	11.0	8.2	2.0
X302	2SD889(R.S)	8.8	8.8	0	8.7	8.7	0
X701	2SC945L(PA)	0	0	0.7	0	0	0.6
X901	2SD882(Q.P)	21.0	28.0	21.0	21.0	28.0	21.0
X902	2SC945L(PA.KA)	15.0	21.0	16.0	15.0	21.0	16.0
X801	2SA733A(P.K)	15.0	0	15.0	15.0	0	15.0
X802	2SC2001(L.K)	0	15.0	0	0	15.0	0
X803	2SC945L(PA.KA)	0	15.0	0	0	15.0	0
X804	2SC945L(PA.KA)	0	0	0.7	0	0	0.6
X805	2SC945L(P.K)	0	1~2	0	0	0~2	0

C. Tester = Circuit Tester (20 kΩ impedance)
E. Voltmeter = Electronic Voltmeter
Tape select switch : NORM

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Block Diagram

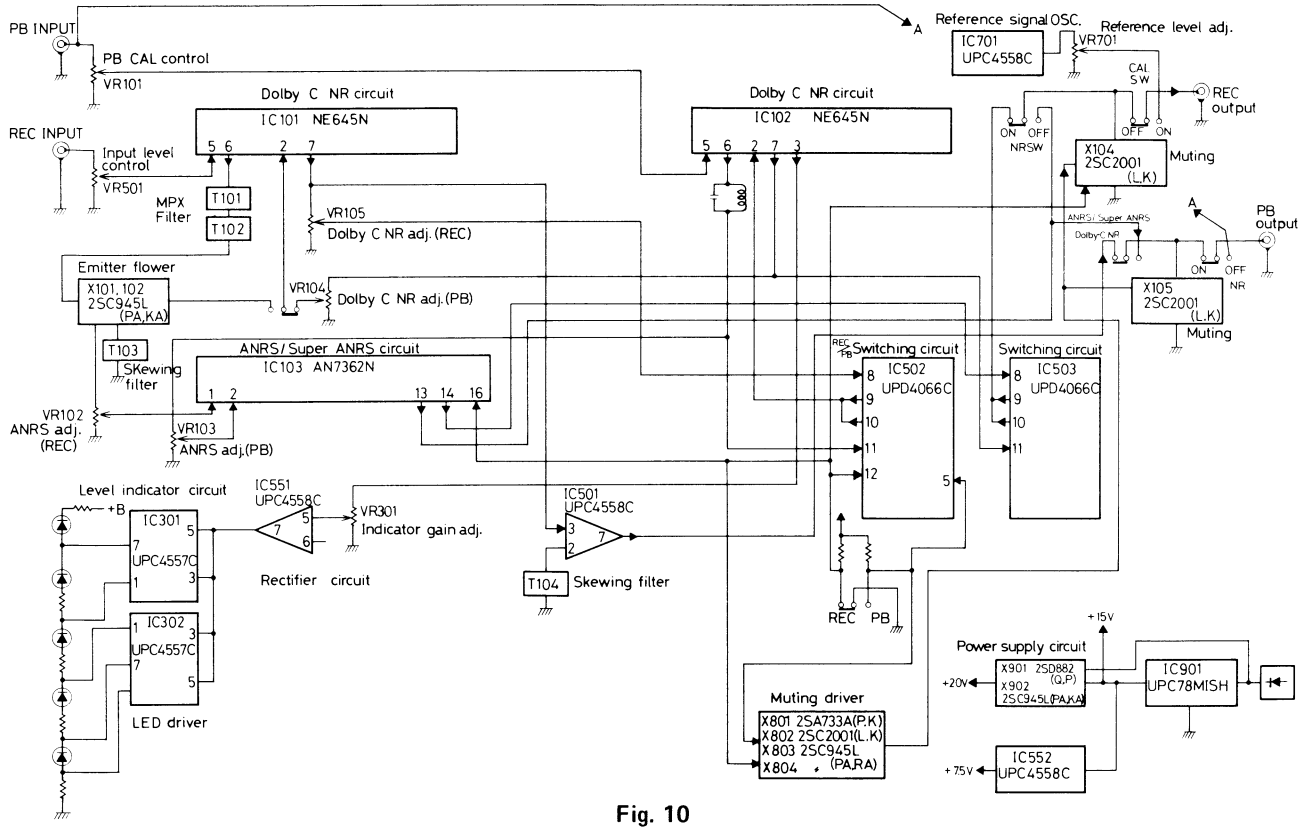


Fig. 10

Main Adjustments

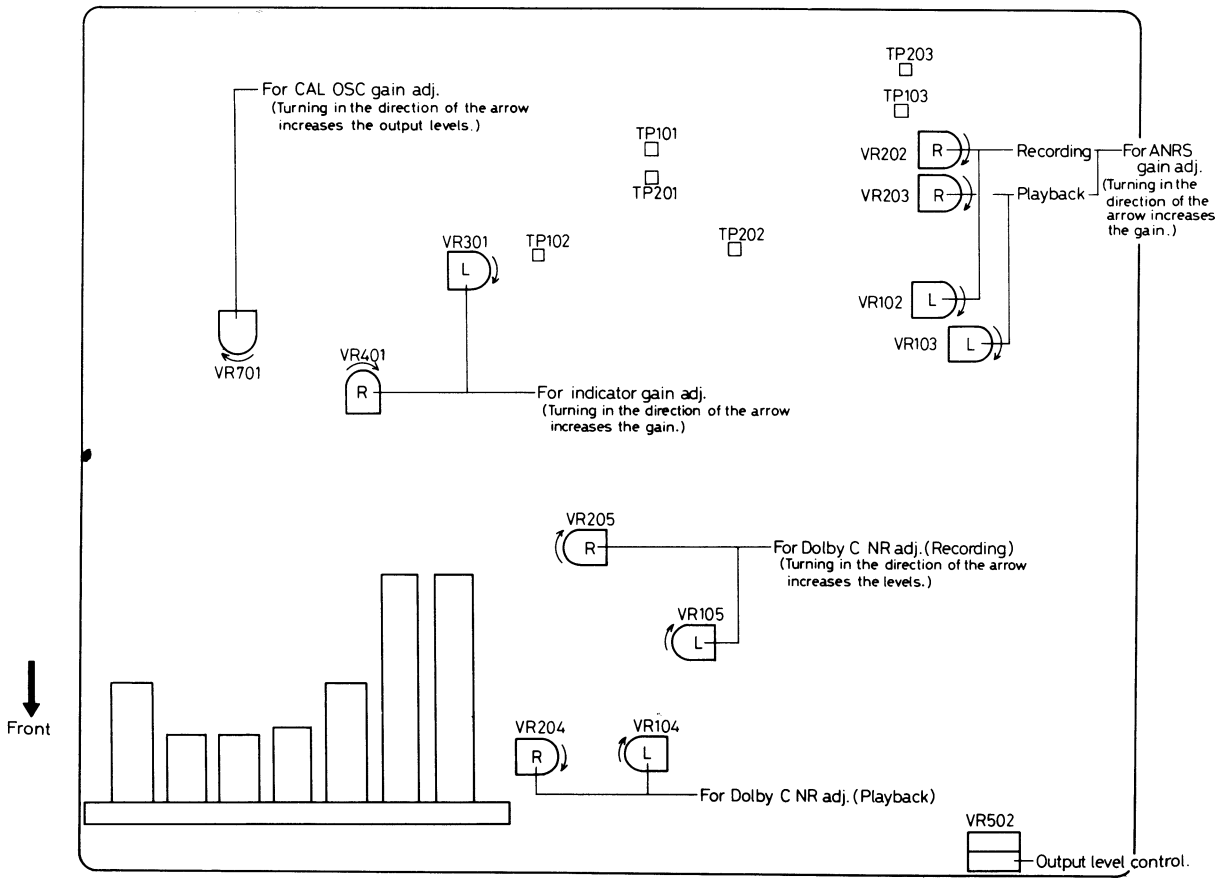


Fig. 11

Adjustment should be performed in the order of steps 1, 2, 3, . . .

(A) Recording gain adjustment

Switch name		Switch position
MODE	–	REC
NR	–	OFF
MPX	–	OFF
CAL	–	OFF

	Item	Adjustment	Adjusting point	Standard value	Remarks
1	Dolby C NR	Apply 400 Hz, –20 dB signal to the LINE IN terminals. Adjust the input level control until the signal is available –2.5 dBs at the TP101, 201. Next, adjust VR105, 205 so that TP102, 202 signal become –2.5 dBs.	VR105, 205	–2.5 dBs	
2	ANRS	Adjust VR102, 202 so that TP103, 203 signal become 0 dBs.	VR102, 202	0 dBs	After this adjustment, be sure to perform the REC OUT level to become –4 dBs ± 1 dB.

(B) Playback gain adjustment

Switch name		Switch position
MODE	–	PB
NR	–	OFF
MPX	–	OFF
CAL	–	OFF

3	Dolby C NR	Apply 400 Hz, –7 dB signal to the PLAY IN terminals. Adjust the PB level control until the signal is available –2.5 dBs at the TP102, 202. Next, adjust VR104, 204 so that TP101, 201 become –2.5 dBs.	TP101, 201	–2.5 dBs	
4	ANRS	Adjust VR103, 203 so that TP103, 203 become 0 dBs.			After this adjustment, be sure to perform the LINE OUT level to become –7 dBs ± 1 dB as same as PLAY IN level. Next, push on the NR switch, and then be sure to perform the LINE OUT level to become –4 dBs ± 1 dB.

(C) Level indicator gain adjustment

Switch name		Switch position
MODE	–	REC
NR	–	OFF
MPX	–	OFF
CAL	–	OFF

	Item	Adjustment	Adjusting point	Standard value	Remarks
5	Level indicator gain	Apply 1 kHz signal to the LINE IN terminals. Adjust the input level control until the signal is available –4 dBs at the REC OUT level. Adjust VR301, 401 so that the REF LED light, and when its signal attenuate 0.6 dB, be sure to perform (–) LED lightes small. – REF + ▶ ■ ◀ 0.6 dB 0.6 dB	VR301, 401	0.6 dB	

(D) CAL OSC gain adjustment

Switch name		Switch position
MODE	–	REC
NR	–	OFF
MPX	–	OFF
CAL	–	ON

6	CAL OSC gain	Adjust VR701 so that REC OUT level become –4 dBs, the same time, be sure to perform the osc. frequency to become 370 Hz ± 10%	VR701	370 Hz ± 10%	

Enclosure Assembly and Electrical Parts

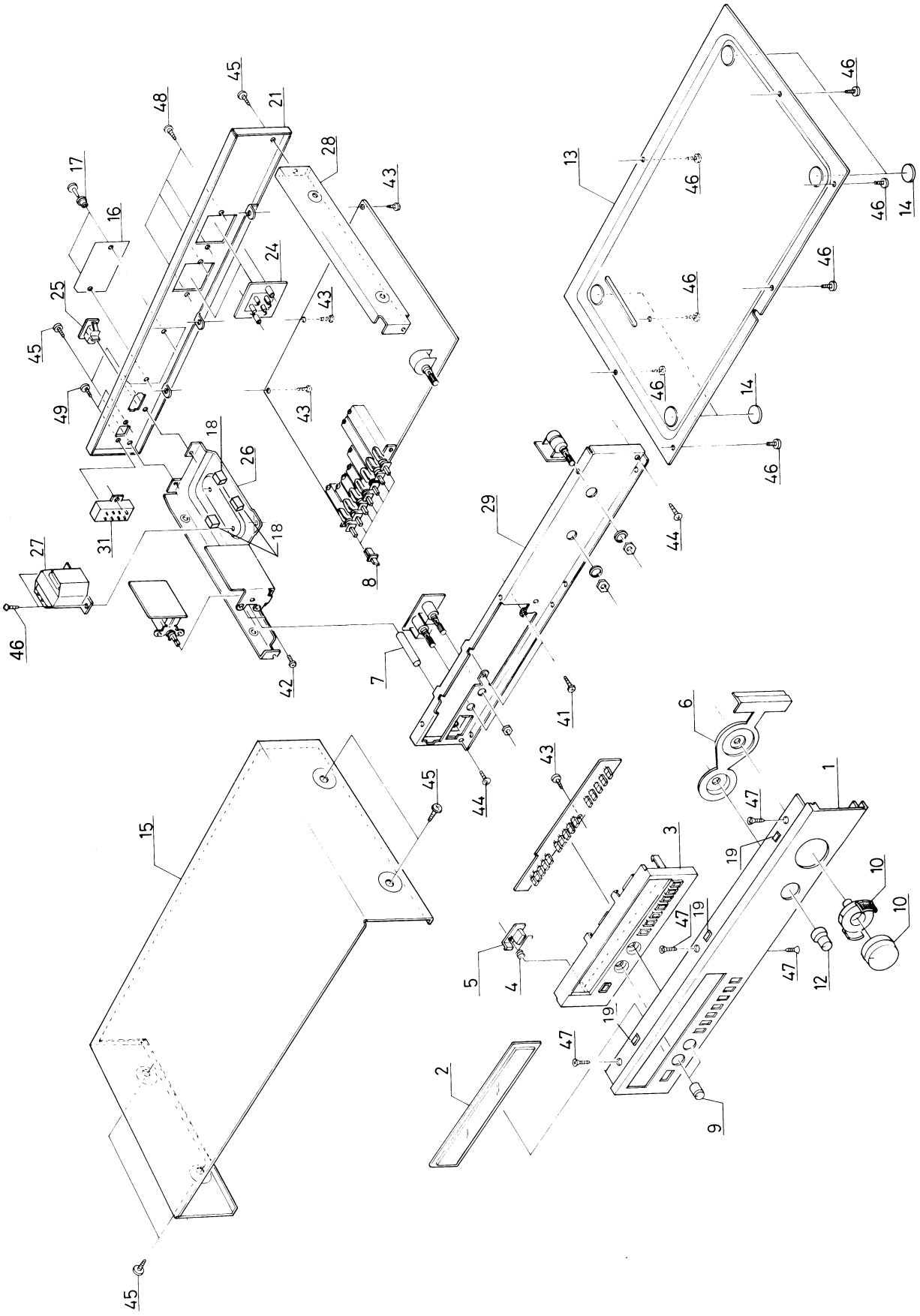


Fig. 12

Enclosure Assembly and Electrical Parts List (except P.W. Board)

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
1~6		ZCNR50Y-CBF	Front Plate Sub Ass'y		1
1		VJC1172-002	Front Plate		1
2		VJK3177-001	Finder		1
3		VJD2176-001	L.E.D. Escutcheon		1
4		VKW4265-002	Button Spring		1
5		VXP4087-001	Push Button	for Power	1
6		VJD3279-001	Volume Escutcheon		1
7		VKS4003-006	Pipe		1
8		VXP4088-001	Push Button		7
9		VXL4132-00A	Knob	for Cal. Level	2
10		VXL4128-001	Volume Knob	Input (R)	1
11		VXL4127-00A	Knob Ass'y	Input (L)	1
12		VXL4103-00B	"	Output	1
13		VJC2048-001	Bottom Cover		1
14		VJF4003-002	Foot		4
15		VJC1171-001	Top Cover		1
16		VYNA410-002	Name Plate		1
17		E48729-002	Plastic Rivet		2
18		VYSR106-010	Spacer	for Power Transformer	3
19		VYSR101-003	Spacer	for Top Cover	3
21		VJC2046-002	Rear Panel		1
22	⚠	QMP2530-200	Power Cord	NR-50A	1
	⚠	QMP9017-009BS	"	NR-50B	1
	⚠	QMP1230-183	"	NR-50C/J	1
	⚠	QMP3950-183	"	NR-50E	1
	⚠	QMP7630-183	"	NR-50U	1
24		VMJ3003-001	Pin Jack Ass'y	NR-50A/B/E/U	1
		VMJ3003-001	"	NR-50C/J	1
25	⚠	QMC0239-002BS	AC Inlet	NR-50A/B/E/U	1
	⚠	QMC0239-002	"	NR-50C/J	1
26		VKL2137-001	Trans. Bracket		1
27	⚠	VTP48C2-011BBS	Power Trans.	NR-50A/B/E/U	1
	⚠	VTP48C2-011B	"	NR-50C/J	1
28		VKL3304-001	Angle		2
29		VKL2136-001	Front Bracket		1
30		QHX2075-001	Wire Clamp		10
31	⚠	QSS2325-011BS	Voltage Select Switch	NR-50A/B/E/U	1
	⚠	QSS2325-011	"	NR-50C/J	1
41		LPSP3006VS	Screw	Push Switch – Front Bracket	2
42		LPSP3006ZS	"	Push Switch	2
43		SBSB3006V	"	LED P.W.B. x 1, Main P.W.B. x 3	4
44		SBSB3006Z	"	Bracket Angle x 2	2
45		SDSB3006R	"	Top Cover x 4, Rear Angle Trans. Bracket x 3	7
46		SDST3006Z	"	Bottom Cover x 7, Transformer x 2	9
47		SSSB3006Z	"	Front Bracket	4
48		SDSB3008R	"	Pin Jack Ass'y	4
49		SDSP3006RS	"	Voltage Select Switch	1

Main P.W. Board Parts

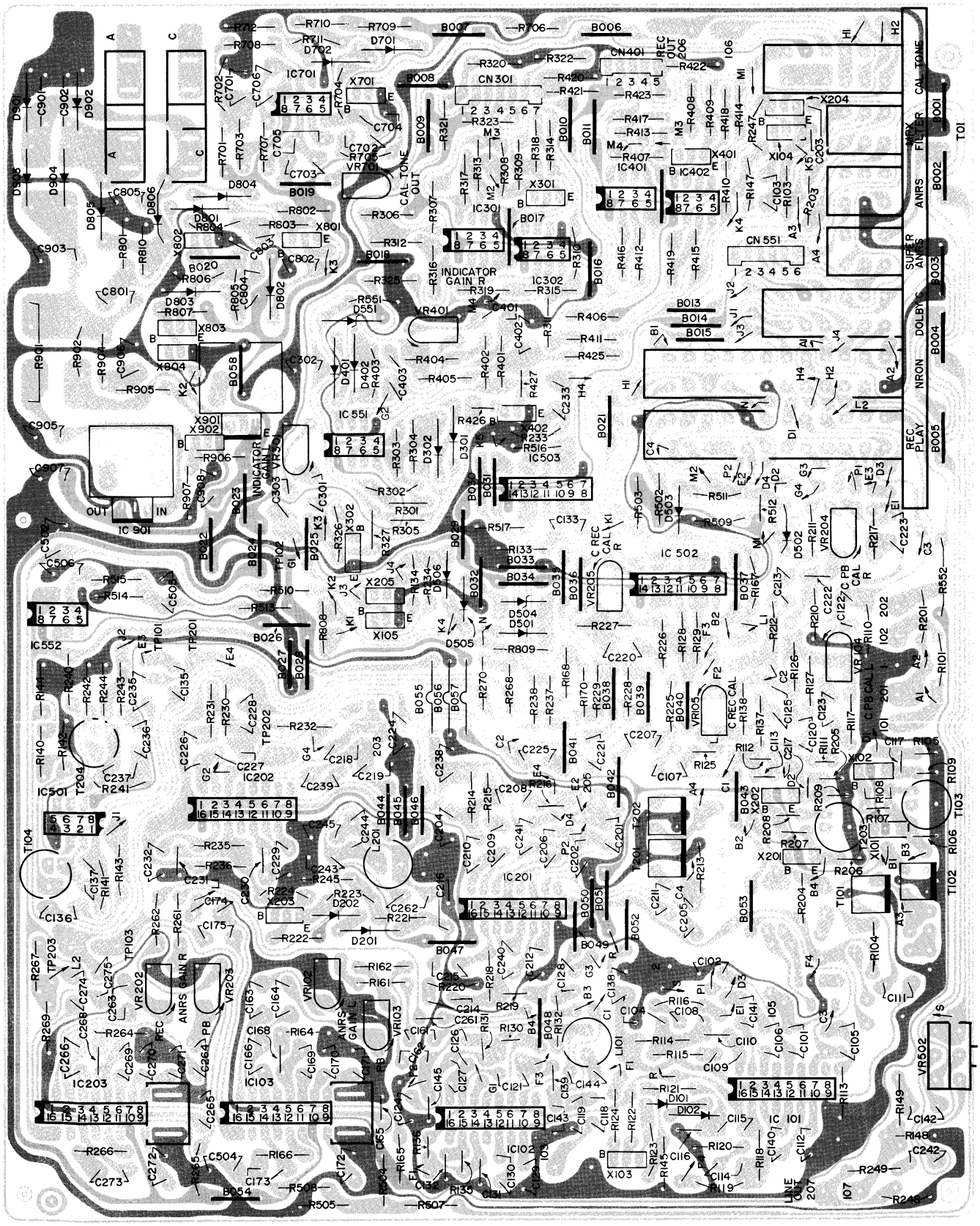


Fig. 13

+B

Earth

Main P.W. Board Parts List

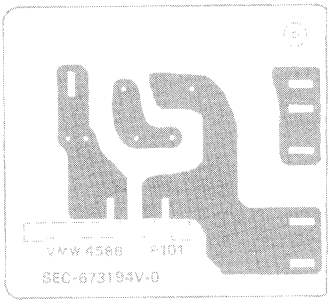
Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
		VMW1558-001	P.W. Board		1
R101, 201, 113, 213, 115, 215, 128, 228, 140, 240, 145, 245, 231, 312, 412, 313, 413, 314, 414, 315, 415, 322, 422, 401, 422, 706, 153, 253, 110, 210		QRD141J-473S	C. Resistor	47 kΩ 1/4 W	30
R103, 203		" -474S	"	470 kΩ "	2
R104, 204		QRD147J-562S	"	5.6 kΩ "	2
R105, 205, 131, 231, 150, 250, 714		QRD143J-473S	"	47 kΩ "	7
R106, 206, 109, 209, 169. 512, 713, 172, 272		" -472S	"	4.7 k Ω "	9
R107, 207		" -332S	"	3.3 kΩ "	2
R108, 208		" -102S	"	1 kΩ "	2
R133, 233, 508		QRD141J-104S	"	100 kΩ "	3
R111		QRD143J-222S	"	2.2 kΩ "	1
R211, 123		QRD141J-122S	"	1.2 kΩ "	2
R112 225,		QRD143J-152S	"	1.5 kΩ "	2
R212, 143, 243, 307, 407, 709, 712, 904, 905, 906		QRD141J-152S	"	1.5 kΩ "	10
R114, 214, 230		QRD147J-133S	"	13 kΩ "	3
R116, 216, 132, 232, 151, 251		QRD141J-181S	"	180 Ω "	6
R117, 217		" -561S	"	560 Ω "	2
R118, 218, 235		" -274S	"	270 kΩ "	3
R119, 236		" -184S	"	180 kΩ "	2
R121, 221, 303, 403		" -105S	"	1 MΩ "	4
R122, 222, 170, 270, 269, 513, 514, 701, 702, 907		" -472S	"	4.7 kΩ "	10
R124, 224, 129, 229		" -224S	"	220 kΩ "	4
R125		QRD143J-152S	"	1.5 kΩ "	1
R302, 507		QRD141J-392S	"	3.9 kΩ "	2
R126, 226, 402		QRD147J-302S	"	3 kΩ "	3
R505		QRD141J-123S	"	12 kΩ "	1
R130		QRD143J-133S	"	13 kΩ "	1
R134, 234, 147, 247, 304, 404, 325, 425, 326		" -103S	"	10 kΩ "	9
R135		" -274S	"	270 kΩ "	1
R136, 219		" -184S	"	180 kΩ "	2
R137, 237, 166, 266		QRD141J-182S	"	1.8 kΩ "	4
R138, 238, 703, 705, 707, 708		" -183S	"	18 kΩ "	6
R141, 241, 502, 503, 509, 511		" -332S	"	3.3 kΩ "	6
R142, 242		" -101S	"	100 Ω "	2
R144, 244		" -273S	"	27 kΩ "	2
R148, 248		QRD147J-104S	"	100 kΩ "	2
R149, 249		" -102S	"	1 kΩ "	2
R161, 261, 162, 262, 516,517, 553		QRD141J-333S	"	33 kΩ "	7
R164, 264		" -680S	"	68 Ω "	2
R165, 265		QRD147J-155S	"	1.5 MΩ "	2
R167, 267		QRD147J-202S	"	2 kΩ "	2
R168, 268, 223		QRD141J-222S	"	2.2 kΩ "	3
R305, 327, 427		QRD143J-101S	"	100 Ω "	3
R405		QRD141J-101S	"	100 Ω "	1
R306, 406, 504, 515		" -822S	"	8.2 kΩ "	4
R308, 408, 309, 409		" -271S	"	270 Ω "	4

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
R310, 410, 905		QRD141J-681S	C. Resistor	680 Ω 1/4 W	3
R311, 411		" -122S	"	1.2 kΩ "	2
R316, 416		" -824S	"	820 kΩ "	2
R317, 417		" -275S	"	2.7 MΩ "	2
R318, 418		" -335S	"	3.3 MΩ "	2
R319, 419		" -275S	"	2.7 MΩ "	2
R320, 420, 323, 423	⚠	" -152S	"	1.5 kΩ "	4
R321, 421, 704, 811		" -223S	"	22 kΩ "	4
R324, 424, 426		QRD143J-103S	"	10 kΩ "	3
R551, 710, 711		QRD141J-821S	"	820 Ω "	3
R552		QRD121K-122	"	1.2 kΩ "	1
R901	⚠	QRG029J-470	OMF Resistor	47 Ω "	1
R902	⚠	QRD149J-100S	C. Resistor	10 Ω "	1
R904		" -681S	"	680 Ω "	1
VR102, 202, 103, 203		QVP8A0B-014	V. Resistor	10 kΩ	4
VR104, 204, 105, 205		QVP8A0B-033	V. Resistor	3 kΩ	4
VR701		" -023	"	2 kΩ	1
VR301, 401		" -024	"	20 kΩ	2
VR502		QVD8A7A-024V	"	20 kΩ	1
C101, 201, 118, 218, 163, 263, 164, 264		QEB41HM-105M	E. Capacitor	1 μF 50 V	8
C119, 219		QCS11HK-470	C. Capacitor	47 pF "	2
C173, 273		QFM41HJ-332	Mylar Capacitor	0.0033 μF "	2
C102, 202		QCS11HK-470	C. Capacitor	47 pF "	2
C103, 203		QFM41HJ-472	C. Capacitor	0.0047 pF "	2
C104, 204, 124, 224, 168, 268		" -273	"	0.027 μF "	6
C105, 205, 106, 206, 142, 242, 166, 266, 301, 401, 109, 209, 126, 226		QET41HR-105N	E. Capacitor	1 μF "	14
C107, 207, 111, 211, 117, 217 121, 221, 122, 222, 125, 225, 130, 230, 133, 233, 136, 236, 139, 239, 140, 240, 141, 241, 161, 261, 162, 262, 303, 403, 502, 506, 703		" -106N	"	10 μF "	33
C108, 208, 128, 228		QFM41HJ-562	Mylar Capacitor	0.0056 μF "	4
C110, 210, 127, 227		" -103	"	0.01 μF "	4
C112, 212, 113, 213		" -473	"	0.047 μF "	4
C114, 214, 131, 231		QFM41HK-473	"	0.047 μF "	4
C115, 215, 116, 216		QFV81HJ-334	"	0.33 μF "	4
C120, 220		QFM41HJ-183	"	0.018 μF "	2
C123, 223, 169, 269		" -222	"	0.0022 μF "	4
C129, 229		QFV81HJ-224	"	0.22 μF "	2
C132, 232		" -154	"	0.15 μF "	2
C135, 235		QET41HR-225N	E. Capacitor	2.2 μF "	2
C137, 237		QCS11HK-471	C. Capacitor	470 pF "	2
C138, 238		QET41AR-227N	E. Capacitor	220 μF 10 V	2
C143, 243		QFM41HJ-182	Mylar Capacitor	0.0018 μF 50 V	2
C144, 244		QCS11HJ-151	C. Capacitor	150 pF "	2
C145, 245		QFM41HJ-272	Mylar Capacitor	0.0027 μF "	2
C165, 265		QFM41HK-103	"	0.01 μF "	2
C170, 270		QEB41HM-334M	E. Capacitor (Low Leak)	0.33 μF "	2
C171, 271		" -475M	"	4.7 μF "	2
C172, 272		QET41CR-227N	E. Capacitor	220 μF 16 V	2
C174, 274, 175, 275		QET41HR-335N	"	3.3 μF 50 V	4
C302, 402		QET41ER-476N	"	47 μF 25 V	2
C504		QET41ER-226N	"	22 μF 10 V	1

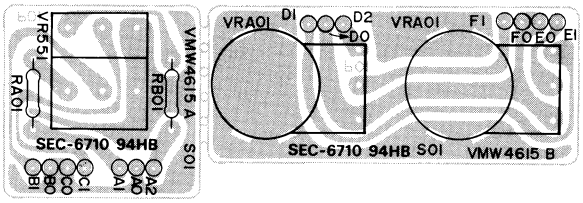
Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
C505, 701		QET41CR-336N	"	33 μF 16 V	2
C702		QET41HR-474N	"	0.47 μF 10 V	1
C704, 705, 706		QFM41HJ-223	Mylar Capacitor	0.022 μF 50 V	3
C901, 902		QCF12HP-103	C. Capacitor	0.01 μF "	2
C903		QET41HR-108N	E. Capacitor	1000 μF "	1
C905		" -475N	"	4.7 μF "	1
C906		QET41VR-227N	"	220 μF 35 V	1
C907, 908		QET41ER-107N	"	100 μF 25 V	2
C909		QCF11HP-103	C. Capacitor	0.01 μF 50 V	1
C910		" -473	"	0.047 μF 50 V	1
D101, 201		1K34A	Ge. Diode	Unizon	2
D102, 202, 701, 702		MA150	Si. Diode	Matsushita	4
D301, 401, 302, 402, 501, 502, 503, 505, 506, 801–804		"	"	Matsushita, or 1SS148	13
D504		RD5.6E(B)	Zener Diode	NEC	1
D551		RD12E(B)	"	"	1
D805, 806		10E1-B	Si. Diode	Nihon Inter	2
D901–904	⚠	"	"	"	4
X101, 201, 102, 202, 103, 203, 701, 902, 803~805, 106, 206 501		2SC945L(PA,KA)	Transistor	NEC	13
X104, 204, 105, 205, 802		2SC2001(L,K)	"	"	5
X301, 401, 302, 402		2SD889(R,S)	"	Matsushita	4
X801		2SA733A(P,K)	"	NEC	1
X901	⚠	2SD882(Q,P)	"	"	1
IC101, 201, 102, 202		NE645N	I.C.		4
IC103, 203		AN7362N	"	Matsushita	2
IC301, 401, 302, 402		UPC4557C	"	NEC	4
IC501, 551, 552, 701		UPC4558C	"	" or AN6552	4
IC502, 503		UPD4066C	"	" or TC4066BP	2
IC901	⚠	UPC78M15H	"	"	1
T101, 201		VQZ0006-002	Filter	95 kHz	2
T102, 202		VQZ0004-003	"	19 kHz	2
T103, 203, 104, 204		VQZ0013-001	"	Skewing	4
L101, 201		VQP0001-183	Inductor		2
		*QSP0271-101	Push Switch		1
CN301		QMV5005-007	Plug Ass'y		1
CN401		" -005	"		1
CN551		" -006	"		1
		VMH4003-001	Heat Sink	X9	1
		SSSP3006ZS	Screw	for Heat Sink	2
		DPSP3008ZS	"	X9	1
		VMH4003-001	Heat Sink	IC901	1
		SSSP3006ZS	Screw	for Heat Sink	2
		DPSP3008ZS	"	IC901	1
		E43727-002	Wrapping Tab		24
B001		V44611-004	Bus Wire		1
		" -009	"	15 mm	3
B002–054, 058		QWY123-019	"		55

Other P.W. Board Parts

Push SW



VR



LED

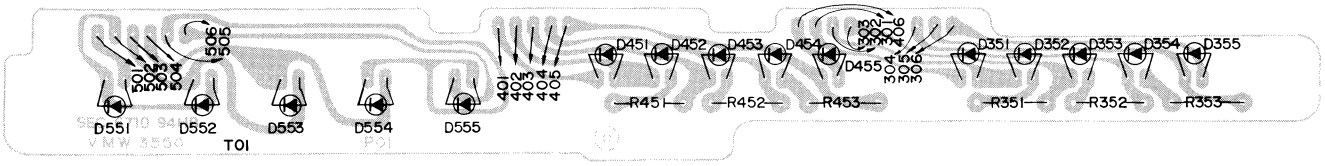


Fig. 14

Other P.W. Board Parts List

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
[Push Switch]		VMW4588-101	P.W. Board		1
	⚠	QSP1110-305BS	Push Switch	NR-50A/B/E/U	1
	⚠	QSP1110-308	"	NR-50C/J	1
C1	⚠	QFZ9010-103	C. Capacitor	NR-50A/B/E/U	1
	⚠	QCZ9014-103	"	NR-50C/J	1
R1	⚠	QRD149J-820S	Fail Safety Resistor	82 Ω 1/4 W	1
		E40130-001	Tab		3
[LED P.W. Board]		VMW3550-001	P.W. Board		1
D351, 451, 352, 452, 354, 454, 355, 455, 551	⚠	SLP-155B-01V	LED	Red	9
D353, 453, 552–554	⚠	SLP-255B-01V	"	Green	6
R351, 451, 353, 453	⚠	QRD147J-152S	C. Resistor	1.5 kΩ 1/4 W	4
R352, 452	⚠	" -821S	"	820 Ω "	2
[VR P.W.Board]		VMW4615-001	P.W. Board		1
		VMW4615-***A			
RA01, B01		QRD147J-473S	C. Resistor	47 kΩ 1/4 W	2
VR551		QVL6A7A-054VL	V. Resistor	50 kΩ	1
		VMW4615-***B	P.W. Board		1
VRA01, B01		QVG9A2A-024V	V. Resistor	20 kΩ	2

Packing

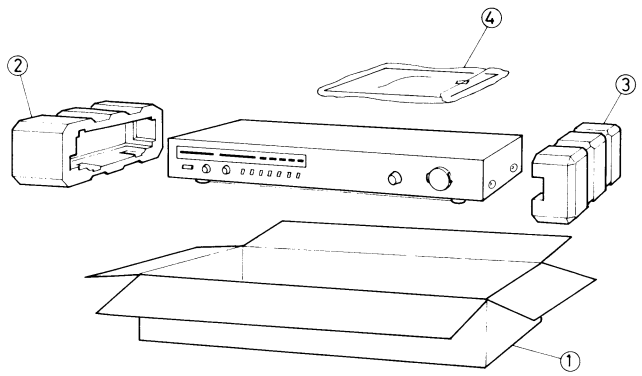


Fig. 15

Position of controls and switch knobs at renewed packing.

Power switch	:	OFF
Timer switch	:	OFF
NR switches	:	OFF
Tape select switches	:	SF/NORM
Input level control	:	DOWN
Input balance	:	Center
Start switch	:	OFF
Preset switch	:	OFF
Monitor switch	:	SOURCE
Meter switch	:	VU
Counter	:	0
Mecha. operation buttons	:	OFF

Packing Material Parts List

Ref. No.	Parts No.	Parts Name	Remarks	Q'ty
1	VPD9048-J02	Carton	NR-50A/B/E/J/U	1
	" -J03	"	NR-50C	1
2	VPH2148-001	Cushion	Left	1
3	VPH2149-001	"	Right	1
	QPGA050-05005	Envelope	for Unit	1
4	AP4056B-077	"	for Instruction Book	1
	TKS000501-04	Sheet	for Unit	1
	AP4056A-036	Envelope	for Provided Cord, Power Cord	2

Accessories

Parts No.	Parts Name	Remarks	Q'ty
VMP0002-00B	PIN Cord		2
VNN0080-301	Instruction Book	NR-50B/E	1
" -901	"	NR-50A/C/J/U	1
BT20029B	Warranty Card	NR-50A	1
BT20025D	"	NR-50C	1
BT20047B	"	NR-50J/U for PX, EES	1
BT20032B	"	NR-50B	1
BT20013C	Guarantee Certificate	NR-50B	1
BT20046	Safety Reply Card	NR-50J/U for PX, EES	1
BT20044B	Safety Instruction	NR-50J	1
TJL000443-01	Seal	Made in Japan, NR-50B	1
	BEAB Label	NR-50B	1
VND4013-001	Warning Label	for Disconnection, NR-50A/B/E	1
QZL1002-003BS	"	for 2-pin Power Cord, NR-50B	1
T44362-001	CSA Marker	NR-50C	1
TLT000505-01	UL/CSA Caution Card	NR-50C/J	3
VNC5311-101	Caution Card	NR-50U for EES	1
E7795-1	EP Mark	NR-50U	1
V04062-002	Simens Plug	NR-50U/E	1
T46328-001	Caution Label	NR-50U	1
E66416-003	Envelope	for Warranty Card	1